
THE
OHIO STATE UNIVERSITY
BULLETIN

Winter Course in Highway Engineering

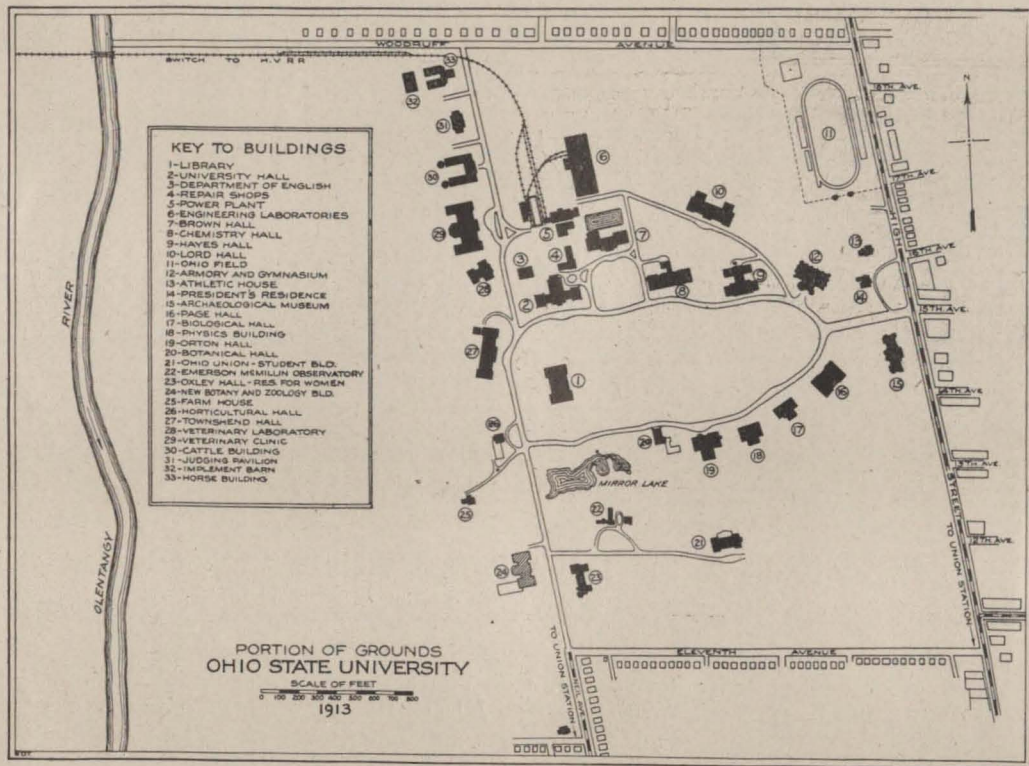
FEBRUARY 16 TO 28, 1914

Given by the Civil Engineering Department of
The Ohio State University

JANUARY, 1914

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WINTER COURSE IN HIGHWAY ENGINEERING

February 16 to 28, 1914.

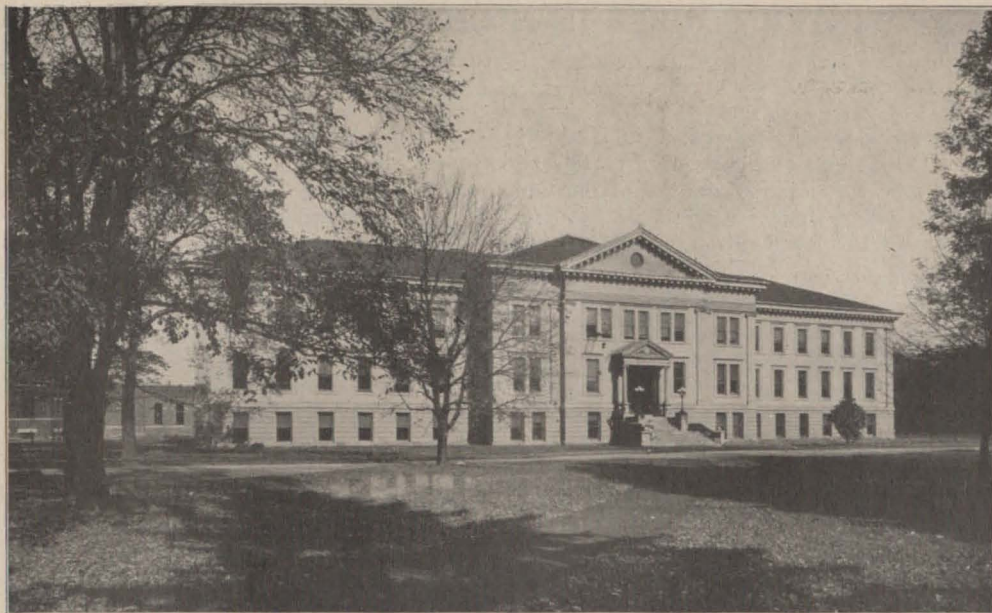
The second annual winter course in Highway Engineering is given by the Civil Engineering Department of the College of Engineering of The Ohio State University. This course was begun last year through the co-operation and aid of the Ohio Good Roads Federation and the State Highway Department of Ohio. It met such strong endorsement and was so well attended from various quarters of the State that the last Legislature made an appropriation for its continuation.

The demand for better roads has developed even more rapidly during the last year than any preceding year since the Good Roads Movement was launched.

National Good Road Congresses have been held during the year at Atlantic City, Detroit, St. Louis, and Philadelphia. Many new laws have been enacted in the various states. Our own state has provided funds by which both inter-county and state-roads or main market roads can be built. Indeed Ohio has accepted the National proposal to aid in good roads by advancing a sufficient sum to claim nearly or quite one-third of all the money appropriated by the United States Government for this purpose in 1912-1913.

This unusual activity in the demand for National and State highways and for inter-county and market roads requires that all county engineers and county commissioners and all others who will be called upon either to direct construction or to construct good roads, should re-burnish and re-inforce their knowledge of the principles of good road construction and especially that they should collect information on all the latest advances made in Highway Engineering.

It is with this in view and with a desire to give a convenient opportunity at a nominal expense to all who wish to bring their road construction knowledge up to date that this short course is given at The Ohio State University.



BROWN HALL

This building was built in 1902 at a cost of \$75,000. It accommodates the Departments of Civil Engineering, Architecture, and Engineering Drawing. The laboratory of the State Highway Commission is also located here. All the lectures in the Highway Engineering Course will be given in Room 50. of this building.

It is not expected to turn out efficient road engineers in two weeks. But men who have either been trained in college, or in the field will be given a large, concentrated review of Highway Engineering brought up to date. There are two classes of men who will probably attend this course. One class will be men having a fair engineering training and more or less experience in road construction. These men will be benefited by the experience brought to them by the speakers from the various states and by the interchange of ideas during the discussions.

The other class who will attend will be men who have had little or no training in road construction and engineering. It is believed, however, that this course, short as it is, will greatly benefit them, because it has been arranged to present the various phases of road construction in a logical way, from sub-grade and drainage to the highest type of paved surfaces. Lectures upon economic and legislative features of the subject will be included. Materials will be exhibited, laboratories inspected and laboratory methods explained. Photographs and moving pictures showing all phases of the subject will be exhibited so that even the novice should be greatly profited.

Men of the highest reputation in their special lines of work have been secured to make this course worth while. Each lecture will be from one hour to one hour and a half long, followed by from twenty to forty minutes discussion. Saturdays will be given over to inspection trips and to such other business as the members in attendance may elect. There are two long sections of experimental roads operated by the State Highway Department within six miles of the University. It is hoped that these, together with many of the city streets and other points of interest may be visited.

EXECUTIVE STAFF.

WILLIAM OXLEY THOMPSON, D. D., LL. D.....President of the University
EDWARD ORTON, JR.....Dean of the College of Engineering
CHRISTOPHER E. SHERMANProfessor of Civil Engineering and Head of the Department
FRANK H. ENO.....Professor of Municipal Engineering. In charge of Highway Engineering

STAFF OF INSTRUCTION.

WILLIAM P. BLAIR.....Secretary National Paving Brick Manufacturers' Association, Cleveland, Ohio
ARTHUR H. BLANCHARDProfessor of Highway Engineering, Columbia University, New York City
JOHN R. CHAMBERLIN, Deputy Highway Commissioner, in charge of Bridges, Ohio State Highway Department
JOSEPH H. CHUBB.....Assistant Engineer Universal Portland Cement Co., Chicago, Illinois
HON. JAMES M. COX.....Governor of Ohio
MAURICE O. ELDRIDGEOffice of Public Roads, Washington, D. C.
FRANK H. ENOProfessor of Municipal Engineering, Ohio State University
ALBERT T. GOLDBECKEngineer of Tests, Philadelphia Testing Laboratory, Philadelphia, Pa.
JOHN W. GRAHAMDistrict Engineer, Bureau of Public Works, Philippine Islands
ADELBERT A. HENDERSONDeputy County Surveyor, Allegheny Co., Pittsburg, Pa.
WILLIAM S. HINDMANAssistant Professor of Civil Engineering, Ohio State University

ALBERT H. HINKLEDeputy Highway Commissioner, in charge of Maintenance.
Ohio State Highway Department

PRÉVOST HUBBARDHighway Efficiency Engineer, New York City
Engineer in charge of Roads and Pavements. The Institute of Industrial Research,
Washington, D. C.

ARTHUR N. JOHNSONState Highway Engineer, Springfield, Illinois

FRANK R. LANDEREx-County Engineer, Cuyahoga County, Cleveland, Ohio

JOHN MACVICARLecturer for the Barber Asphalt Paving Co.
Ex-Chief of Departments of Streets and Public Improvements,
Des Moines, Iowa

JAMES R. MARKERHighway Commissioner, Ohio State Highway Department

CLYDE T. MORRISProfessor of Civil Engineering, Ohio State University

EDWARD ORTON, JR.Dean of the College of Engineering, Ohio State University

HOMER C. PRICEDean of the College of Agriculture, Ohio State University

LOUIS C. SABINGeneral Superintendent of St. Mary's Falls Canal, Sault Ste. Marie, Mich.

ROY K. SCHLAFLYAssistant Professor of Civil Engineering, Ohio State University

PHILIP P. SHARPLESChief Chemist, Barrett Manufacturing Co., Boston, Mass.

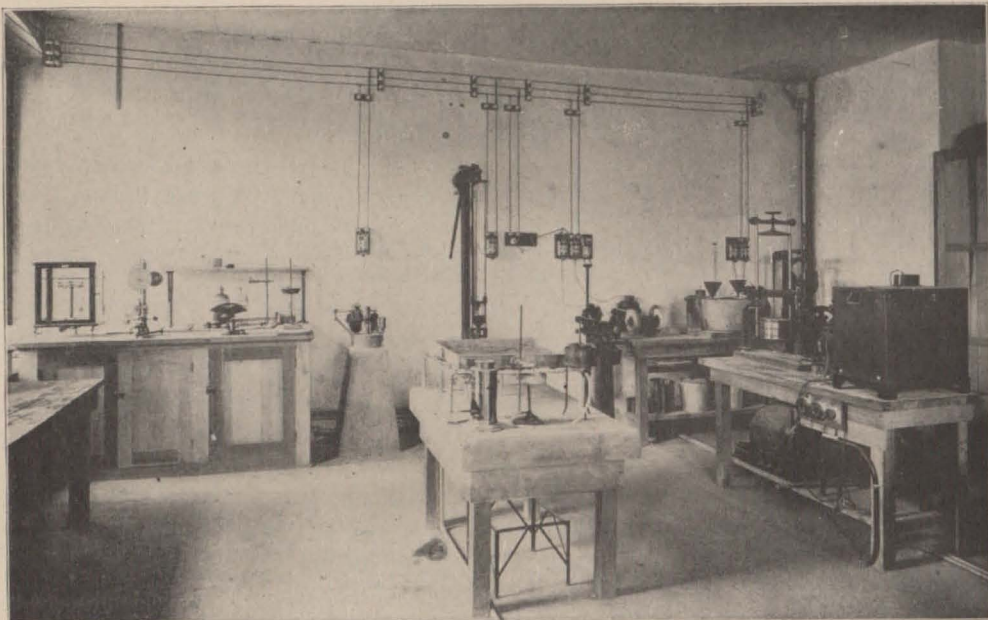
LEONARD S. SMITH.....Professor of Civil Engineering in charge of Department of Roads and Pavements,
University of Wisconsin, Madison

JESSE TAYLORPresident of Ohio Good Roads Federation and Editor of "Better Roads,"
Jamestown, Ohio

WILLIAM O. THOMPSONPresident of the Ohio State University

A. D. WILLIAMSChief Road Engineer, Morgantown, West Virginia

JAMES R. WITHROWProfessor of Chemical Engineering, Ohio State University



HIGHWAY LABORATORY

In this laboratory, samples of road materials from all parts of Ohio are studied and tested. In an adjoining shed, rattlers for brick testing are also installed. This work is done in co-operation with the State Highway Commission.

GENERAL INFORMATION

ADMISSION.

Admission to this course will be without examination and upon registration with the Secretary of the College of Engineering, Room 126, Lord Hall.

A fee of two dollars will be charged for registration.

Those expecting to attend will please write to Prof. Edward Orton, Jr., Dean of the College of Engineering, notifying him of their intention as early as possible, and asking for any further information which they may desire.

DATE OF OPENING.

Registration will be held in the Dean's office, Room 126, Lord Hall, University Campus, on Monday, February 16th, from 8:00 to 11:00 A. M.

Dr. W. O. Thompson, President of the University, will deliver the address of welcome in Room 50, Brown Hall, at 11:00 A. M. Monday, February 16th.

Regular lectures will begin at 1:30 P. M. Monday, February 16th, in the same room.

All lectures will be given in this room.

No text books will be required, but it is hoped that note books will be freely used.

LIVING ARRANGEMENTS.

Board and lodging at very reasonable rates can be secured at several of the down town hotels.

THE RAILWAY Y. M. C. A. Corner of High and Goodale Streets.

Single rooms \$3.50 per week. Meals 25c each.

For two in a room, \$2.00 per week each.

THE STAR HOTEL, High Street near Chestnut.

Single rooms, \$5.00 to \$7.00 per week. Meals 25c.

For two in a room, \$3.50 each.

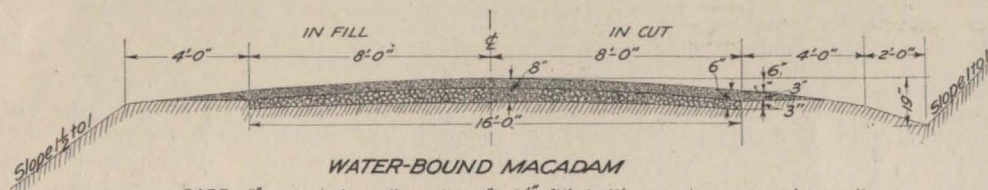
THE NEW COLUMBUS HOTEL, Corner 5th and Long Streets.

Rooms \$6.00 per week without baths. \$9.00 with baths.

For two in a room, \$9.00 without baths, \$12.00 with baths.

This Hotel is run on European plan.

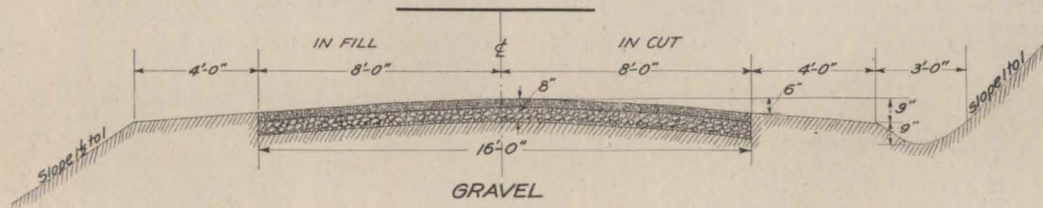
For those who prefer to room and board near to the University, rooms may be secured at from \$3.00 to \$5.00 per week. A list of such rooms may be obtained at the Dean's office when registering. Good meals may be secured at the "Union," the student's building, located on the southern part of the Campus, or at several near-by restaurants on High Street.



WATER-BOUND MACADAM

BASE - 5" crushed stone, dimensions 1" to $2\frac{1}{2}$ ", filled with screenings or gravel, proportions 1 screenings to 4 stone. Thoroughly rolled, sprinkled and rolled.

SURFACE - 3" crushed stone, dimensions $\frac{3}{4}$ " to $1\frac{1}{2}$ ", rolled - filled with screenings or gravel, sprinkled and rolled. No excess binder



GRAVEL

BASE - 5" gravel, not larger than $2\frac{1}{2}$ ". Gravel selected with suitable binding material or such material added. Roll well.

SURFACE - 3" gravel not larger than 1", must contain a binding material. Sprinkle and roll well.

ROAD SECTIONS

TIME SCHEDULE

MONDAY, FEBRUARY 16.

8:00 to 11:00 A. M.—Register in the Dean's Office, Room 126, Lord Hall, secure Winter Course Bulletin and Schedule of Lectures.

All Lectures will be given in Room 50, Brown Hall.

- (1) 11:00 A. M.—Address of Welcome

PRESIDENT W. O. THOMPSON

- (2) 1:30 P. M.—“Good Roads, from the Farmer's View Point”

DEAN HOMER C. PRICE

- (3) 3:00 P. M.—“Better Roads, from the Taxpayer's View Point”

MR. JESSE TAYLOR

TUESDAY, FEBRUARY 17.

- (4) 8:30 A. M.—“Roads in Ohio”

MR. JAMES R. MARKER

- (5) 10:00 A. M.—“Earth Roads, their Improvement and Maintenance”

MR. MAURICE O. ELDRIDGE

- (6) 1:30 P. M.—“Gravel and Macadam Roads”

MR. MAURICE O. ELDRIDGE

- (7) 3:00 P. M.—“Alignment and Grades”

PROFESSOR ROY K. SCHLAFLY



CLASS PICTURE
Class of Winter Highway Engineers—1913

WEDNESDAY, FEBRUARY 18.

- (8) 8:30 A. M.—“Subgrades and Foundations”

PROFESSOR FRANK H. ENO

10:00 A. M.—Convocation,

Chapel, University Hall

11:00 A. M.—Visit to the University Library,

Conducted by MR. CHAS. W. REEDER, of the Library Staff

- (9) 1:30 P. M.—“The Road Building Materials of Ohio”

PROFESSOR CHRISTOPHER E. SHERMAN

- (10) 3:00 P. M.—“What the Road Builder and Engineer Should Know about Road Stone”

MR. ALBERT T. GLOBECK

6:30 P. M.—Dinner at Ohio Union

Road Topic Toasts

THURSDAY, FEBRUARY 19.

- (11) 8:30 A. M.—“Road Legislation, Present and Future”

PROFESSOR ARTHUR H. BLANCHARD

- (12) 10:00 A. M.—“Ohio Road Legislation, Present and Future”

GOVERNOR JAMES M. CON

- (13) 1:30 P. M.—“Bituminous Surfaces and Bituminous Pavements”

PROFESSOR ARTHUR H. BLANCHARD

- (14) 3:30 P. M.—“Foreign Highways” (Illustrated)

PROFESSOR ARTHUR H. BLANCHARD

FRIDAY, FEBRUARY 20.

Concrete Day

- (15) 8:30 A. M.—**"Cement, Sand, and Stone for Concrete"**
MR. LOUIS C. SABIN
- (16) 10:00 A. M.—**"Concrete for Foundations and Road Structures"**
PROFESSOR FRANK H. ENO
- (17) 1:30 P. M.—**"Cement and Concrete Laboratory. Lecture and Demonstration"**
PROFESSOR CLYDE T. MORRIS
PROFESSOR WILLIAM S. HINDMAN
- (18) 8:00 P. M.—**"Concrete Road Construction"** (Illustrated)
MR. JOSEPH H. CHUBB

SATURDAY, FEBRUARY 21.

- (19) 8:30 A. M.—Inspection Trip to the State Experimental Road, Nelson Avenue, built by the State Highway Department, July to November, 1909. It represents 7 types, 17 forms of Road Construction.
- 12:30 P. M.—Lunch at Busy Bee Restaurant
- (20) 1:30 P. M.—Inspection Trip to the State Experimental Road, on South High Street, built in 1912-13. It represents 8 types and 31 forms of Road Construction.

MONDAY, FEBRUARY 23.

Brick Day

- (21) 8:30 A. M.—“The Relations of the Engineer to the Manufacturer in the Selection of Paving Brick”

DEAN EDWARD ORTON, JR.

- (22) 10:00 A. M.—“Brick Pavement Construction”

MR. WILLIAM P. BLAIR

- (23) 1:30 P. M.—“Maintenance and Repair of Brick Pavements”

MR. FRANK R. LANDER

- (24) 3:00 P. M.—“Experimental Roads in Ohio and Lessons from Them”

MR. ALBERT H. HINKLE

- (25) 8:00 P. M.—“Pavements, Brick and Otherwise” (Illustrated)

MR. WILLIAM P. BLAIR

TUESDAY, FEBRUARY 24.

Bridges and Drainage

- (26) 8:30 A. M.—“Culverts and Bridges”

MR. ADELBERT A. HENDERSON

- (27) 10:00 A. M.—“Some Lessons for the Bridge Engineer from the 1913 Flood”

MR. JOHN R. CHAMBERLIN

- (28) 1:30 P. M.—“The Organization and Management of Working Forces on State Highways”

MR. ARTHUR N. JOHNSON

- (29) 3:00 P. M.—“The Necessity for Good Drainage and the Effect of Poor Drainage on Various Types of Roads”

MR. ARTHUR N. JOHNSON

WEDNESDAY, FEBRUARY 25.

- (30) 8:30 A. M.—“Lessons in Highway Construction from Wisconsin”

PROFESSOR LEONARD S. SMITH

10:00 A. M.—Convocation,

Chapel, University Hall

11:00 A. M.—Visit the Ceramic and Mechanical Laboratories

- (31) 1:30 P. M.—“Highway Structures”

PROFESSOR CLYDE T. MORRIS

- (32) 3:00 P. M.—“Local Materials for Local Roads”

PROFESSOR A. D. WILLIAMS

- (33) 8:00 P. M.—“The Construction of Bitulithic Pavements” (Illustrated by moving pictures)

MR. ASA GODDARD

THURSDAY, FEBRUARY 26.

Asphalt Day

- (34) 8:30 A. M.—“Bitumens”

PROFESSOR JAMES R. WITHROW

- (35) 10:00 A. M.—“What the Road Builder and Engineer Should Know about Asphalt”

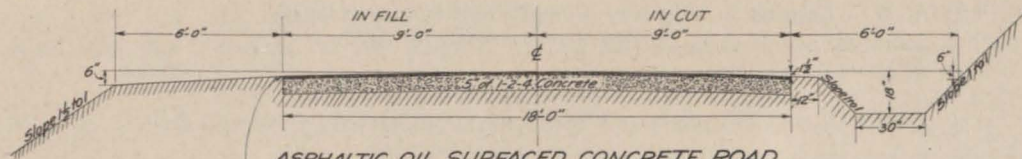
MR. PREVOST HUBBARD

- (36) 1:30 P. M.—“Bitumens and Tar in Miscellaneous Forms of Road Construction”

MR. PHILIP P. SHARPLES

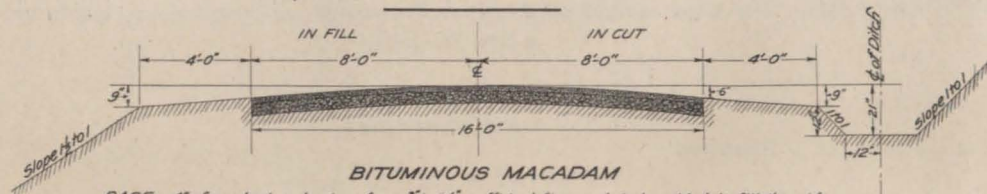
- (37) 3:30 P. M.—Visit the Road Laboratory of the State Highway Department

Conducted by MR. ABEL S. REA



ASPHALTIC OIL SURFACED CONCRETE ROAD CALIFORNIA

$\frac{1}{2}$ " Bituminous wearing surface composed of $\frac{1}{2}$ gal asphaltic oil per square yard, upon which is spread No. 4 screenings sufficient to absorb the free oil. Oil is applied at temperature of from 180° to 250°F



BITUMINOUS MACADAM

BASE - 4" of crushed rock, sizes from $\frac{3}{4}$ " to $2\frac{1}{2}$ ", sufficient finer rock to be added to fill the voids. Roll thoroughly. Apply one gallon of hot asphaltic oil per square yard. Upon this coat apply $\frac{3}{4}$ gallon of thick asphaltic mixture per square yard.

WEARING SURFACE - 2" in thickness after compacting, composed of crushed stone from $\frac{1}{2}$ " to $1\frac{1}{2}$ " in dimensions, heated and mixed with sufficient amount of asphaltic cement so that when thoroughly rolled the excess asphalt will be brought to surface. Then apply thin coating of stone chips and roll.

ROAD SECTIONS

FRIDAY, FEBRUARY 27.

- (38) 8:30 A. M.—“The Use of Miscellaneous Methods and Materials in Highway Construction”

PROFESSOR FRANK H. ENO

- (39) 10:00 A. M.—Open

- (40) 1:30 P. M.—“Construction and Maintenance of Highways in the Philippine Islands”

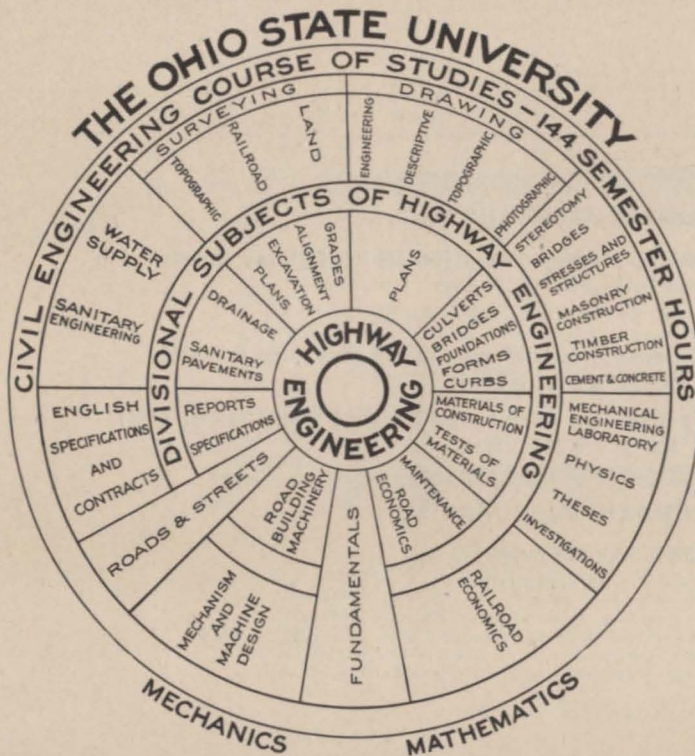
MR. JOHN W. GRAHAM

- (41) 4:00 P. M.—“The Asphalt Industry from the Lake to the Finished Road” (Illustrated)

MR. JOHN MACVICAR

SATURDAY, FEBRUARY 28.

- (42) 8:30 A. M.—Inspection Trip for the Forenoon only,
To be arranged



TOTAL COURSE

FUNDAMENTAL - 51 HRS.

Mathematics	20
Mechanics	10
Chemistry	8
Physics	6
English	4
Geology	3

CULTURAL - 24 HRS.

Language	8
Astronomy	6
English	4
Military Drill	4
Gymnasium	2

DRAWING - 22 HRS.

Engineering Drawing	11
Topographical Drawing	3
Stereotomy	3
Timber Construction	3
Photography	2

SURVEYING - 12 HRS.

Land	5
Railroad	4
Topographic	3

TECHNICAL - 45 HRS.

Masonry Construction	6
Mechanical Engineering Laboratory	5
Thesis	5
Stresses and Structures	4
Bridges	4 + 4
Railroad Economics	4
Roads and Streets	3
Cement and Concrete	3
Water Supply	3
Mechanism & Machine Design	2
Electrical Engineering	2
Specifications & Contracts	2
Sanitary Engineering	2

TOTAL 150+4

Diagram Showing the Relation between the Civil Engineering Course and Highway Engineering

THE CIVIL ENGINEERING COURSE

At The Ohio State University

It is believed that a special course for Highway Engineering leading to a degree is not desirable at this time except as it may be based upon the completed four years' course in Civil Engineering, as usually given by the leading Universities. A highway engineer must be thoroughly grounded in the fundamentals of all engineering, namely, Mathematics, Physics, Chemistry, Mechanics, and English. He should have a good working knowledge of all the common engineering technical subjects. The regular Civil Engineering course gives him this foundation upon which he may specialize or build a more specific knowledge of the chemistry and the handling of some of the more complex road building materials, such as oils, asphalts, tars, etc. He can expand in more detail, also, on the economics and methods of road construction.

The diagram upon the opposite page is designed to show the relation of the present course of Civil Engineering in the Ohio State University to the requirements of the Highway Engineer. Under plainly cultural work, there are 18 hours of mental and 6 hours of physical training. The fundamental division contains 51 hours, including again four hours English counted once in the cultural division. The 12 hours of surveying and 22 hours of drawing are all directly applicable to Highway Engineering. While in the 45 hours of technical work, 34 hours are directly applicable and about one-half of the remaining 11 hours is directly or closely connected with necessary instruction in highway work. At least 135 to 140 hours out of the 150 hour Civil Engineering course would be included in any well rounded Highway Engineering course. It would seem wise, therefore, to place any additional training in Highway Engineering upon the foundation of a completed Civil Engineering course rather than to make an undergraduate course of it leading to a separate degree.



UNIVERSITY HALL.

THE UNIVERSITY.

The Ohio State University, located at Columbus, is a part of the educational facilities maintained by the State. It comprises seven colleges and a graduate school.

- The College of Agriculture,
- The College of Arts, Philosophy, and Science,
- The College of Education,
- The College of Engineering,
- The College of Law,
- The College of Pharmacy,
- The College of Veterinary Medicine,
- The Graduate School.

The College of Engineering offers seven distinct courses leading to degrees, namely:

- Architecture,
- Ceramic Engineering,
- Chemical Engineering,
- Civil Engineering,
- Electrical Engineering,
- Mechanical Engineering,
- Mine Engineering.

These courses are all of four years duration. In addition, two-year courses are given in Clay-working, Industrial Arts and Shopwork, and Mining.

For information on these subjects address W. E. Mann, University Editor, Columbus, Ohio.

The Ohio State University Bulletin is issued at least twenty times during the year; monthly in July, August, September and June, and bi-weekly in October, November, December, January, February, March, April, and May.

It is published by the University at Columbus and entered as second-class matter November 17, 1903, at the postoffice at Columbus, Ohio, under the Act of Congress, July 16, 1894.

WINTER COURSE IN HIGHWAY ENGINEERING—1914

THE OHIO STATE UNIVERSITY, COLUMBUS

FIRST WEEK, FEB. 16 TO 21

HOUR	MON. 16	TUES. 17	WED. 18	THUR. 19	FRI. 20	SAT. 21	
8:30	Registration In Room 126 Lord Hall	Roads in Ohio Mr. Jas. R. Marker	Subgrades and Foundations Prof. F. H. Eno	Road Legislation, Present and Future Prof. A. H. Blanchard	Concrete Day Cement, Sand and Stone Mr. L. C. Sabin	Inspection Trip over Experimental Roads and City Streets	
9:30		Discussion	Discussion	Discussion	Discussion		
10:00		Earth Roads, their Improvement and Maintenance Maurice O. Eldridge	Convocation University Chapel	Ohio Road Legisla- tion, Present and Future Gov. Jas. M. Cox	Concrete for Founda- tions and Road Structures Prof. F. H. Eno		
11:00		Address of Wel- come Pres. W. O. Thomp- son	Discussion	Visit Library Guide Chas. Reeder	Discussion		Discussion
11:45							
1:30	Good Roads from the Farmer's View Point Dean H. C. Price	Gravel and Macadam Roads Mr. Maurice O. Eldridge	The Road Building Materials of Ohio Prof. C. E. Sherman	Bituminous Surfaces and Bit. Pavements Prof. A. H. Blanchard	Cement and Con- crete Laboratory Demonstrations Prof. C. T. Morris Prof. W. S. Hind- man		
2:30	Discussion	Discussion	Discussion	Discussion			
3:00	Better Roads from the Taxpayer's View Point Mr. Jesse Taylor	Alignment and Grades Prof. R. K. Schlaffy	What the Road Builder and Engr. Should Know About Road Stone Albert T. Goldbeck	Foreign Highways Illustrated Prof. A. H. Blanchard			
4:00	Discussion	Discussion	Discussion				
4:45							
8:00 P. M.				Dinner at Ohio Union. 6:30 P. M. Road Topic Toasts	Concrete Roads (Illustrated) Mr. Joseph Chubb		

WRITE TO THE UNIVERSITY EDITOR FOR BULLETIN FULLY DESCRIBING THE COURSE

WINTER COURSE IN HIGHWAY ENGINEERING—1914

THE OHIO STATE UNIVERSITY, COLUMBUS

SECOND WEEK, FEB. 23 TO 28

HOUR	MON. 23	TUES. 24	WED. 25	THUR. 26	FRI. 27	SAT. 28
	Brick Day	Bridge and Drains	Lessons in Highway Construction from Wisconsin	Asphalt Day	The Use of Miscellaneous Materials for Highway Construction	Inspection Trip to be Arranged
8:30	The Relations of the Engr. to the Manfr. in the selection of Paving Brick Dean Edward Orton	Culverts and Bridges Mr. A. A. Henderson Deputy Co. Surv.	Prof. Leonard S. Smith	Bitumens Prof. J. R. Withrow	Prof. F. H. Eno	
9:30	Discussion	Discussion	Discussion	Discussion	Discussion	
10:00	Brick Pavement Construction Mr. Wm. P. Blair	Some Lessons for Bridge Engrs. from the 1913 Floods Mr. J. R. Chamberlin	Convocation University Chapel	What the Road Builder and Engr. should know about Asphalt Mr. Prevost Hubbard		
11:00 11:45	Discussion	Discussion	Visit Ceramic and Mechanical Laboratories	Discussion		
1:30	Maintenance and Repair of Brick Pavements Mr. W. C. Perkins	The Organization and Management of Road Making Forces Mr. A. N. Johnson	Highway Structures Prof. C. T. Morris	Bitumens and Tar in Miscellaneous Forms of Road Construction Mr. Philip P. Sharples	Construction and Maintenance of Highways in the Philippine Islands Mr. J. W. Graham	
2:30	Discussion	Discussion	Discussion	Discussion	Discussion	
3:00	The Experimental Roads in Ohio Mr. A. H. Hinkle	The Necessity for Good Drainage and the Effect of Poor Drainage on Various Types of Roads Mr. A. N. Johnson	Local Materials for Local Roads Prof. A. D. Williams	Visit to Road Laboratory Mr. Abel S. Rea	Asphalt Industry, Lake to Road, Illustrated by Moving Pictures 4 p. m. Mr. John MacVicar	
4:00 4:45	Discussion	Discussion	Discussion	Discussion		
8:00 P. M.	Pavements, Brick and Otherwise (Illustrated) Mr. Wm. P. Blair	Moving Pictures, Roads from Other Lands	The Construction of Bitulithic Pavements (Illustrated) Mr. Asa Goddard			

WRITE TO THE UNIVERSITY EDITOR FOR BULLETIN FULLY DESCRIBING THE COURSE